

a graft material defining two renal apertures each oriented to align with one of the two renal arteries when the stent-graft is in an expanded state; and

a stent system for supporting the graft material in a contracted state wherein each renal aperture is contracted and the expanded state wherein each renal aperture is expanded.

6. ~~(Canceled).~~ The stent-graft of claim 1, wherein the stent system, when in the expanded state, is adapted to press against a portion of the aortic wall above the first renal artery and against a portion of the aortic wall above the second renal artery.

31
7. ~~(Amended).~~ [The stent-graft of claim 6,] A stent-graft for bridging an aneurysm in an aorta, the aneurysm being at least partially disposed between two renal arteries and two iliac arteries, comprising:

a graft material defining two renal apertures each oriented to align with one of the two renal arteries when the stent-graft is in an expanded state; and

a stent system for supporting the graft material in a contracted state wherein each renal aperture is contracted and the expanded state wherein each renal aperture is expanded;

wherein the stent system, when in the expanded state, is adapted to press against a portion of the aortic wall above the first renal artery and against a portion of the aortic wall above the second renal artery;

wherein the graft material defines a mesenteric aperture oriented to align with a superior mesenteric artery when the stent-graft is in an expanded state.

8. The stent-graft of claim 7, wherein the stent system supports the mesenteric aperture and when in the expanded state, is adapted to press against a portion of the aortic wall above the superior mesenteric artery.

9. The stent-graft of claim 8, wherein the graft material defines a celiac aperture oriented to align with a celiac axis artery when the stent-graft is in the expanded state.

10. The stent-graft of claim 9, wherein the stent system supports the celiac aperture and when in the expanded state, is adapted to press against a portion of the inner wall of the aorta above the celiac axis artery.

14. ~~(Canceled).~~ The graft of claim 1, wherein the stent-graft further includes at least one stem and a leg attachable to the stem.

19. A process of bridging a defect disposed in a main vessel near one or more branch vessels, comprising:

using three dimensional imaging, positioning, within the main vessel, a contracted graft having a sidewall defining one or more apertures;

using three dimensional imaging, aligning the graft within the main vessel such that each aperture aligns with at least a respective one of the branch vessels; and

expanding the graft to an expanded state wherein the one or more apertures are aligned with the one or more branch vessels and the graft presses against a wall of the main vessel.

20. The process of claim 19, wherein aligning the graft includes partially expanding the graft and rotating the graft while partially expanded about its longitudinal axis to align the one or more apertures in the sidewall of the graft with the one or more branch vessels.

21. A process of bridging a defect disposed in a main vessel near one or more branch vessels, comprising:

inserting, within the main vessel, a graft in a contracted state, the graft defining one or more apertures;

aligning the graft within the main vessel such that each aperture aligns with at least a respective one of the branch vessels; and

expanding the graft to an expanded state wherein the one or more apertures are aligned with the one or more branch vessels and the graft presses against a wall of the main vessel;

wherein aligning the graft includes partially expanding the graft and aligning the graft while partially expanded;

wherein partially expanding the graft includes maintaining the graft in at least a partial martensite phase while forcibly expanding the graft.

22. A process of bridging a defect disposed in a main vessel near one or more branch vessels, comprising:

inserting, within the main vessel, a graft in a contracted state, the graft defining one or more apertures;

aligning the graft within the main vessel such that each aperture aligns with at least a respective one of the branch vessels; and

expanding the graft to an expanded state wherein the one or more apertures are aligned with the one or more branch vessels and the graft presses against a wall of the main vessel;

wherein aligning the graft includes partially expanding the graft and aligning the graft while partially expanded;

wherein partially expanding the graft includes heating the stent to a temperature between an austenite start temperature and an austenite finish temperature of the graft.

23. (Canceled). ~~A process of manufacturing a graft for bridging a defect in a main vessel, the defect being disposed in the main vessel near one or more branch vessels extending from the main vessel, the process comprising:~~

~~developing a three dimensional image of an interior of the main vessel including the one or more branch vessels prior to inserting the graft in the main vessel; and~~

~~using the three dimensional image to form one or more apertures in the graft prior to inserting the graft within the main vessel, each aperture configured to align with a respective one of the one or more branch vessels.~~

25. (Canceled). ~~The stent-graft of claim 1, wherein at least one of the renal apertures is elongated in a circumferential direction.~~

26. (Canceled). The stent-graft of claim 1, wherein the stent system includes one or more supporting portions each attached to the graft material surrounding the perimeter of a respective one of the one or more apertures.

27. (Canceled). The stent-graft of claim 1, wherein the stent system is formed from a shape memory alloy having an AF temperature of 37°C or less.

28. (Canceled). The stent-graft of claim 1, wherein the stent system is formed from a shape memory alloy having an AF temperature greater than 37°C and an MS temperature less than 37 °C.

29. The process of claim 19, wherein the main vessel is an aorta and the defect is an aneurysm.

30. The process of claim 21, wherein aligning includes using three-dimensional imaging.

31. The process of claim 21, wherein aligning the graft includes partially expanding the graft and rotating the graft, while partially expanded, about its longitudinal axis to align the one or more apertures of the graft with the one or more branch vessels, the apertures being defined in a sidewall of the graft.

32. The process of claim 22, wherein aligning includes using three-dimensional imaging.

33. The process of claim 22, wherein aligning the graft includes partially expanding the graft and rotating the graft, while partially expanded, about its longitudinal axis to align the one or more apertures of the graft with the one or more branch vessels, the apertures being defined in a sidewall of the graft.

34. (Cancelled). The process of claim 23, wherein the main vessel is an aorta and the one or more branch vessels include a renal artery.

35. (Cancelled). A stent-graft for bridging an aneurysm in an aorta, the aneurysm being at least partially disposed between two renal arteries and two iliac arteries, comprising:

a graft material defining at least one renal aperture oriented to align with one of the two renal arteries when the stent-graft is in an expanded state; and

a stent system for supporting the graft material in a contracted state wherein each renal aperture is contracted and the expanded state wherein each renal aperture is expanded.

36. (Cancelled). The stent-graft of claim 35, wherein the stent system, in its expanded state, and the graft material each extend from above the one of the renal apertures to below the one of the renal apertures to form a continuous tubular member.

14
37. (Amended). [The stent-graft of claim 35,] A stent-graft for bridging an aneurysm in an aorta, the aneurysm being at least partially disposed between two renal arteries and two iliac arteries, comprising:

a graft material defining at least one renal aperture oriented to align with one of the two renal arteries when the stent-graft is in an expanded state; and

a stent system for supporting the graft material in a contracted state wherein each renal aperture is contracted and the expanded state wherein each renal aperture is expanded;

further including a radiopaque marker surrounding the perimeter of a respective renal aperture.

15
38. (Amended). [The stent-graft of claim 35,] A stent-graft for bridging an aneurysm in an aorta, the aneurysm being at least partially disposed between two renal arteries and two iliac arteries, comprising:

32
a graft material defining at least one renal aperture oriented to align with one of the two renal arteries when the stent-graft is in an expanded state; and
a stent system for supporting the graft material in a contracted state wherein each renal aperture is contracted and the expanded state wherein each renal aperture is expanded;
wherein each renal aperture is larger than the orifice of the respective renal artery.

33
Please add new claims 39-49 as follows:

34
39. (New). A graft for bridging an aneurysm at least partially disposed in an aorta between two renal arteries and two iliac arteries, comprising:
graft material adapted to extend from above at least one of the two renal arteries to a region below the aneurysm without substantially extending into either of the two renal arteries; and
at least one renal aperture defined by the graft material for aligning with a respective one of the two renal arteries; and
wherein the graft material is adapted to expand from a contracted state wherein the at least one renal aperture is contracted and an expanded state wherein the at least one renal aperture is expanded and the graft material presses against a wall of the aorta.

35
40. (New). The graft of claim 39, wherein the graft material defines a unitary tubular member adapted to extend from above at least one of the two renal arteries to the region below the aneurysm without substantially extending into either of the two renal arteries.

36
41. (New). The graft of claim 40, wherein the at least one renal aperture defines an opening larger than an orifice of the respective renal artery so as not to obstruct the respective renal artery when the graft material is in the expanded state.

42. (New). The graft of claim 39, wherein the at least one renal aperture defines an opening larger than an orifice of the respective renal artery so as not to obstruct the respective renal artery when the graft material is in the expanded state.

43. (New). The graft of claim 42, further including a stent system attached to the graft material.

2 44. (New) The stent-graft of claim 43, wherein the stent system further defines at least one aperture aligned with the at least one renal aperture defined by the graft material.

45. (New). A stent-graft for bridging an aortic aneurysm at least partially disposed between two renal arteries and two iliac arteries, comprising:

a stent system; and

a unitary piece of graft material attached to the stent system and adapted to extend from above at least one of the two renal arteries to a location near the distal end of the aneurysm, the graft material defining at least one renal aperture for aligning with a respective one of the two renal arteries;

wherein the at least one renal aperture is contracted when the graft material is in a contracted state and wherein the at least one renal aperture is expanded when the graft material is an expanded state; wherein the at least one renal aperture in the expanded state defines an opening larger than an orifice of the respective one of the two renal arteries.

46. (New). The stent-graft of claim 45, wherein the at least one renal aperture includes a single renal aperture and the unitary piece of graft material includes a first end adapted to be located between the two renal arteries and a second end adapted to be located near the distal end of the aneurysm.

47. (New). The stent-graft of claim 45, wherein the at least one renal aperture includes two renal apertures and the unitary piece of graft material is adapted to extend